

A new species of *Lycodon* from Panay Island, Philippines

(Reptilia, Serpentes, Colubridae)*

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Lycodon fausti, spec. nov. is described from Antique Province, Northwest Panay, Philippines. So far only the holotype, a juvenile, is known. The new species is characterized by its high number of subcaudal scales (135, all other Philippine *Lycodon* species have less than 130 subcaudals) and the dorsal colour pattern: 24 mottled white and brown bands across the otherwise dark brown back, which are bordered on both sides by a small white line. The lighter bands are two scales wide medially, and extend to a width of three to four scales lateroventrally. The space in between is broader than the adjacent bands, seven to eight scales wide medially, and five to seven scales wide lateroventrally.

This is the first record of an indigenous *Lycodon* species for the West Visayan Island Group. Only the widespread, introduced *Lycodon aulicus capucinus* was known from this region so far.

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Introduction

10 *Lycodon* species were reported from the Philippines previously. One, the widespread *L. aulicus capucinus*, is not considered as an indigenous member of the Philippine fauna. It is the only member of the genus which can be found all over the Philippines, usually in the direct surrounding of human dwellings, an important indication for its dispersal by man.

The other nine species, eight of which are endemic to the Philippines, have a very limited distribution within the country. Most are confined to one of the Philippine faunal regions or subregions, as defined in Leviton (1963), de Jong & Treadaway (1993), Heaney & Regalado (1998) and others. *L. subcinctus sealei* occurs in the Palawan region (and outside the Philip-

pines), *L. dumerili* in the Mindanao subregion of the Mindanao region, *L. ferroni* in the East Visayan subregion of the Mindanao region, *L. alcalai*, *L. bibonius*, *L. chrysoprateros*, *L. solivagus*, and *L. tessellatus* in the Luzon region (including the Batan and Babuyan Island Groups), and *L. muelleri* is known from the Luzon and the Mindoro region (which is considered as part of the Luzon region by some authors, e.g. Leviton 1963) (Fig. 1).

During herpetological investigations conducted in the northwestern part of Panay (West Visayan region), under the auspices of the Philippine Endemic Species Conservation Project (PESCP), a joint project of the DENR and Ruhr-University Bochum, supported by the Frankfurt Zoological Society, a juvenile *Lycodon* was obtained. It is the first record of an indigenous

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Fig. 1. Distribution of the indigenous *Lycodon* species within the Philippines and the Philippine faunal regions.

and endemic *Lycodon* species not only for the island of Panay, but for the entire West Visayan region. This snake is differentiated from any other known species of this genus, and therefore described here as a new species.

Material and methods

The snake was preserved in 70% alcohol in the Philippines. After exporting the species for examination to Germany (Gratuitous Permit No. 93 and Wildlife Export Certification 7066), measurements

of its length were taken with a bar scale, and of its head with a dial caliper. Meristic characters were examined using a binocular microscope. Sutures between head shields were measured with the aid of a micrometer attached to a binocular microscope.

In several more recent publications (Lanza 1999, Leviton 1965, Ota 2000, Ota & Ross 1994), detailed meristic and morphometric data as well as pictures and drawings of the Philippine *Lycodon* species are published and discussed. These works were used for comparison with the new *Lycodon* species. Besides, one *L. muelleri* (SMF 18071) and one *L. dumerili* (SMF 18065) from the Senckenberg Museum, Frankfurt, were investigated, as well as

the holotypes of *L. alcalai* (PNM 990), *L. bibonius* (PNM 2044), *L. chrysoprateros* (PNM 2045), and *L. solivaqus* (PNM 2046) in the Philippine National Museum in Manila. Due to the clear differences between the new species and the other ones, it was not considered necessary to loan more material.

Museum abbreviations: MZUF = Museo Zoologico Università Firenze; NMW = Naturhistorisches Museum Wien; PNM = Philippine National Museum, Manila; SMF = Forschungsinstitut Senckenberg, Frankfurt.

Lycodon fausti, spec. nov.

Figs 2-3

Holotype: PNM 7271, a juvenile, from Barangay Guia, Municipality Pandan, Antique Province, NW Panay Peninsula, Philippines; brought to the PESCP staffhouse in Bulanao in early April 2001 by the PESCP veterinary Enrique Sanchez, after having been killed in the garden of his brother.

Diagnosis. *L. fausti* is characterized as a member of the genus *Lycodon* by the following features: body elongate and cylindrical; head moderately distinct from neck and somewhat flattened; maxillary teeth separated into three series by two diastemata.

PNM 7271 differs from congeners by a combination of the following characters: 1. anal scale undivided; 2. 135 subcaudal scales; 3. mid-body scales in 17 rows; 4. 24 mottled white and brown bands across the otherwise dark brown back, which are bordered on both sides by a small white line; the light bands are two scales wide medially, and extend to a width of three to four scales lateroventrally; space in between broader than adjacent bands, seven to eight scales wide medially, narrowing lateroventrally (Fig. 2); 5. head surface dark reddish brown, with irregular lighter markings in temporal and loreal region; 6. ventralia light cream, uniform at anterior part, with lateral brown markings posteriorly; 7. subcaudalia heavily mottled brown, becoming darker towards tip (Fig. 3).

Description of holotype

Head distinct from neck, slightly flattened; snout projects beyond lower jaw; pupil roundish; body subcylindrical, rounded on dorsum, flattened ventrally; vertebral ridge poorly developed. Head slightly crushed during capture, therefore teeth not completely preserved. However, the division into three groups by two

diastemata is still discernable on right side. Anterior group consists of seven teeth, the three posterior ones being much larger than anterior ones, teeth of middle and posterior group not complete (maxillary bone broken and twitched), but probably not more than two or three each.

Rostral narrow, triangular, distinct from above; nasal divided by nostril, anterior part much smaller than posterior part; nine supralabials, fourth and fifth entering eye; nine infralabials on right side, 10 on left side; first pair in contact behind mental; first to fifth border anterior chin shields, fifth and sixth enter posterior chin shields; loreal almost square; two preoculars, the upper one larger than the lower, on right side both in contact with loreal and on left side upper separated from loreal by lower preocular and prefrontal; three postoculars, the lowest one on right side not in contact with anterior temporals, the others in contact with anterior temporals; temporals 2+2+3 right and 2+3+3 left, the uppermost one in the middle row of left side very small; dorsal scales smooth, lacking apical pits; scale rows: 19 behind head, reducing to 17 at position of ventral shield 7, reducing to 15 between ventral shield 135 and 139 (not exactly determinable because of slight cutaneous damage due to capture).

Vertebral scales as large as adjacent scales, 211 on body, 134 on tail; 207 ventral scales, each slightly angulated laterally; anal shield entire; subcaudals paired, 135 on each side.

Colour in alcohol: dorsal surface of head dark reddish brown, with very indistinct lighter markings, outer margins of parietals with more prominent whitish markings; loreals, preoculars, postoculars, and temporals mottled whitish and brown; supralabials whitish along lower margins, with irregular dark brown markings along upper margins; an irregular band of mottled brown and whitish scales across posterior part of head, two scale rows wide medially, widening to five scale rows lateroventrally; ventral surface of head cream white, with tiny brown spots below left corner of mouth.

Dorsal ground colour of body and tail dark brown, with 24 transverse light bands across body and 21 on tail; each light band narrow medially (about two scale rows wide on body and one to two on tail), broadening lateroventrally (three to four scale rows wide on body and two to three on tail); each light band with a mottled brown and whitish central portion and

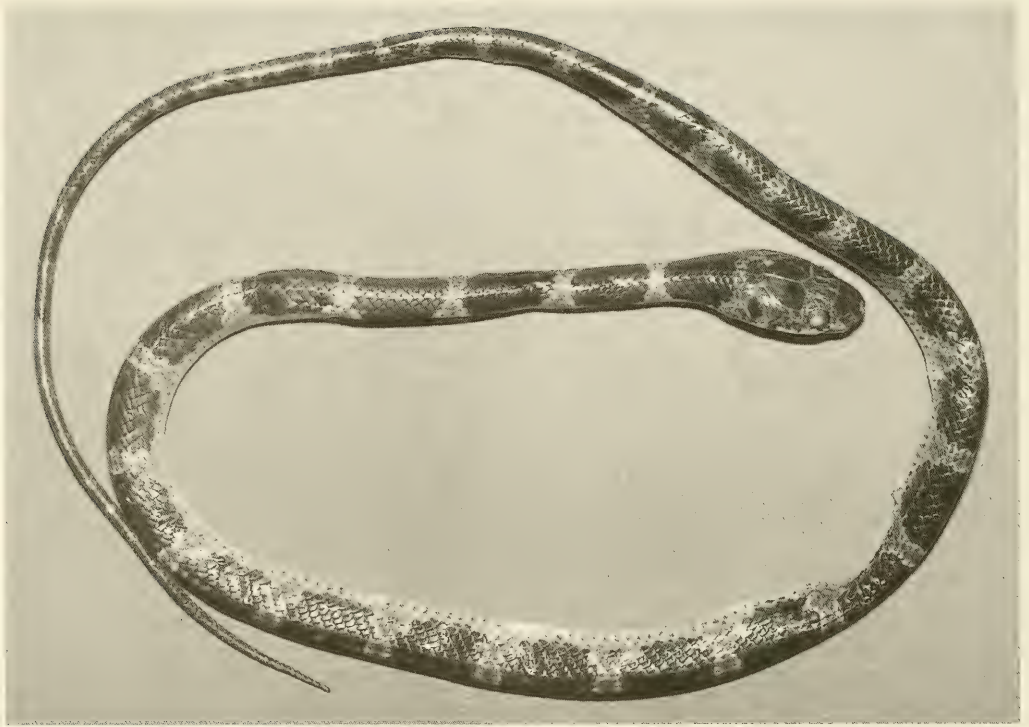


Fig. 2. Dorsal view of *Lycodon fausti*, spec. nov. (PNM 7271).

small whitish margins; lower part of dorsals bordering ventrals whitish, separating dark interspaces from ventrals. Dark brown interspaces much wider than light bands, seven to eight scale rows wide along midline on body and four to five on tail, narrowing lateroventrally. Ventrals uniform cream white up to ventral 16, posterior ones with small brown spots laterally; the dark brown markings become more prominent at second half of body. Ventral surface of tail cream white with numerous dark brown spots at anterior part and brown with indistinct light mottling at posterior part.

Measurements (in mm): Snout-vent length 236, tail length 101, head width 7.8, head depth 4.6, internasal suture 0.6, prefrontal suture 1.4.

Natural history. The snake was found hiding in a shed in the garden of Jude Sanchez in the small village Guia (exact locality given above, under Holotype) by one of his househelpers, who killed it. Realizing that it was a very uncommon snake, it was shown to Enrique Sanchez, the veterinary of PESCP, who decided to

show it to the herpetologist of PESCP.

In front of the garden a coconut plantation grows. The Malumpati River, which is surrounded by swamplands and some secondary growth, flows close to the area. An adult which most probably belongs to the same species (identification and observation by Arnold Demegillo) was sighted some time ago at around 10 am., resting on a branch near a river in a secondary growth area. The locality was: near to Barangay Badiangan, Southern Pandan area, NW Panay.

Distribution. So far only known from NW Panay.

Etymology. The species is named in honour of the late President of the Zoological Society Frankfurt, which is the main sponsor of PESCP.

Comparisons

Leviton (1965) recognized five species of the genus *Lycodon* from the Philippines: *L. aulicus capucinus* Boie, 1826, *L. subcinctus sealei* Leviton, 1955, *L. tessellatus* Jan, 1863, *L. muelleri*

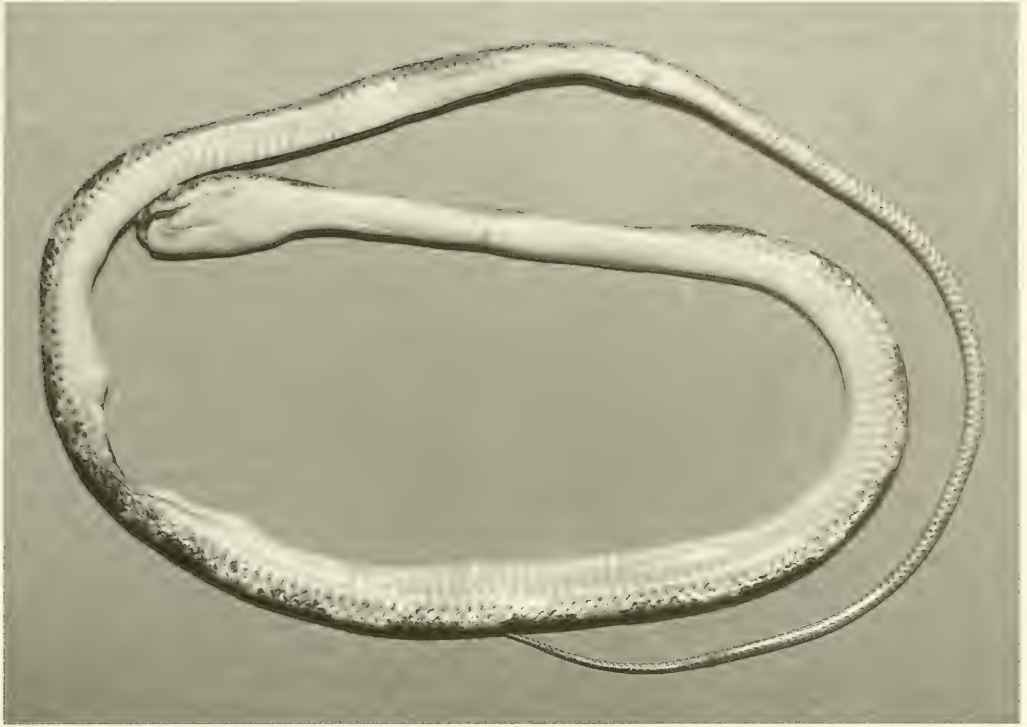


Fig. 3. Ventral view of *Lycodon fausti*, spec. nov. (PNM 7271).

Duméril, Bibron & Duméril, 1854, and *L. dumerili* (Boulenger, 1893). Four more Philippine congeners are described by Ota & Ross (1994): *L. alcalai*, *L. bibonius*, *L. chrysoprateros*, and *L. solivagus*, and one by Lanza (1999): *L. ferroni*.

L. aulicus capucinus, *L. subcinctus sealei*, and *L. tessellatus* differ from all other *Lycodon* species known from the Philippines in having fewer than two preoculars, less than 80 subcaudals, and a divided anal. Until recently, *L. tessellatus* (known from two specimens only) was separated from all other Philippine *Lycodon* species referring to its undivided nasal (e.g. Lanza 1999, Leviton 1965, Ota & Ross 1994). However, the examination of the holotype (NMW 21708) by Ota (2000) revealed that this species has a divided nasal like its congeners, and is closely related to *L. aulicus* (including *L. a. capucinus*). It can be differentiated from *L. aulicus* by its peculiar dorsal colour pattern, consisting of three longitudinal series of alternating squarish black spots.

The remaining Philippine species show an overall similarity in pholidosis, having an entire anal, more than 100 subcaudals, and two,

or one and two preoculars. However, the new species is the first Philippine *Lycodon* with more than 130 subcaudals, and in accordance with the subcaudal count more than 130 vertebral scales on the tail. Outside the Philippines, only one *Lycodon* with more than 130 subcaudals is known. *L. albofuscus* from Nias, Sumatra, and Borneo has 155-208 paired subcaudals, so actually much more than *L. fausti*. Besides, *L. albofuscus* has a divided anal, strongly keeled dorsals, and a completely different colour pattern.

L. fausti can also be distinguished by the number and/or appearance of the light body and tail bands from its related Philippine congeners: It differs from *L. muelleri* in having only 24 instead of 51-70 ($n=9$, Ota & Ross 1994) light body bands, and 21 instead of 30-38 tail bands.

From *L. dumerili* and *L. ferroni* it differs in their number (15-19 body bands and 10-12 tail bands in *L. dumerili* [$n=6$, Ota & Ross 1994]; 17 body bands and 10 tail bands in the single known specimen of *L. ferroni*), and in their appearance. While the light bands of *L. dumerili* and *L. ferroni* are broad and almost white, and

the dark bands surround the body (in *L. ferroni*) or at least encroach on the ventrals, the light bands of *L. fausti* are small and rather light brown than white, and the dark bands don't even border the ventrals.

It differs from *L. alcalai* and *L. chrysoprateros* in the possession of light body and tail bands (both have a more or less uniform brown dorsal side), and from *L. solivagus* in the development and appearance of the body bands, which occur only on the anterior part of the body in *L. solivagus*.

It differs from *L. bibonius* in the appearance of the body bands, which have very irregular margins in *L. bibonius* (Ota & Ross: Fig. 6A, p. 164) while those of *L. fausti* are symmetrical. The dark interspaces of *L. bibonius* contain some light mottling, while those of *L. fausti* are uniform dark. The head of *L. bibonius* is light brown, while the head of *L. fausti* is dark reddish brown.

Because no variation is known for the new species so far, it does not seem appropriate to

discuss other pholidosis characteristics besides of the subcaudal counts. As the investigations of the other species have demonstrated (Leviton 1965, Ota & Ross 1994), numbers of head shields like temporals, pre- and postoculars may be variable. *L. ferroni*, like *L. fausti*, so far is known only from the holotype (36690 MZUF), therefore nothing is known on its variability either.

For comparison of different meristic and morphometric characters of the new species with the previously described Philippine congeners with undivided anale and more than 100 subcaudals, see Tab. 1.

The most recent key to the entire genus is given in Lanza (1999), and the most recent key to the Philippine *Lycodon* species in Ota (2000). Therefore it does not seem necessary to bring a revised key to fit in one more species. With the combination of its subcaudal counts and its colour pattern, the new species can be easily distinguished.

Tab. 1. Some meristic and morphometric characters of the new *Lycodon* species in comparison to the seven related species from the Philippines (data from Ota & Ross 1994:163, and Lanza 1999), and their distribution. Abbreviations: TL=tail length, SVL=snout-vent length, INS=length of suture between internasals, PFS=length of suture between prefrontals.

	<i>L. fausti</i> , n=1 juvenile	<i>L. alcalai</i> n=6	<i>L. bibonius</i> n=6, all juveniles	<i>L. chryso- prateros</i> n=5	<i>L. solivagus</i> n=2	<i>L. muelleri</i> n=9	<i>L. dumerili</i> n=6	<i>L. ferroni</i> n=1 juvenile
Ventrals	207	203-207	204-212	186-194	198-203	205-213	209-215	204
Subcaudals	135	108-126	110-120	111-117	112-115	112-127	111-120	109
Supralabials	9	9	7-9	9	9	9	9	10
Infralabials	9 left, 10 right	10	9-10	10	10	10	9-10	10
Preoculars	2	2	2	2	2	1-2	1-2	2
Postoculars	3	3	2-3	2-3	3	2-3	2	2
Body bands	24	none	22-25	none on anterior part of body	14	51-70	15-19	17
Tail bands	21	none	16-21	none	none	30-38	10-12	10
TL/SVL	42.8	40.4-42.0	35.1-37.8	41.0-41.2	41.2-42.9	38.9-44.3	33.4-38.9	33.6
INS/PFS	42.8	22.6-29.6	31.8-42.9	36.0-43.5	38.1-42.4	26.1-40.6	21.1-32.8	34.4
Distribution (faunal region)	NW-Panay (West Visayan region)	Batan Island (Luzon region)	Camiguin Island (Luzon region)	Dalupiri Island (Luzon region)	Cordillera Central, North-Luzon (Luzon region)	Central- Luzon, Polillo, Mindoro (Luzon- and Mindoro region)	Mindanao, Basilan (Mindanao region)	Samar (East Visayan subregion of the Mindanao region)

Discussion

Besides of the mentioned meristic and colour pattern differences between the new species and its congeners, biogeographical evidence shows that a closer relationship with most of the other species is extremely unlikely. *L. alcalaui*, *L. bibonius*, and *L. chrysoprateros* are known from just one small island each in the Batan, respectively Babuyan Island Groups, which are situated between Luzon and Taiwan (Fig. 1). If those species were not able to bridge the gap between different islands of these groups, it is more than unlikely that one of them can turn up in a geographically widely separated region. *L. solivagus* is only known from the northern part of the Cordillera Central in North-Luzon. Ota & Ross (1994) assume that *L. solivagus* is restricted to this area, a region which is geographically almost as separated from the Visayan Islands as are the Batan- und Babuyan Islands. *L. dumerili* and *L. feroni*, which are closely related with each other (Lanza 1999) inhabit different areas of the Greater Mindanao region. They show no similarity with the new species, therefore even a closer relationship can be excluded. The remaining *L. muelleri* is known from Central-Luzon, Polillo and Mindoro. Recent herpetofaunistic investigations suggest that at least the Central-Luzon region seems to have closer faunal relations with Panay (Ferner et al. in print, Gaulke 2001) than previously assumed. Judged from its subcaudal counts, *L. muelleri* is closest to *L. fausti*, too, so it is assumed that it is the closest relative. However, differences in colour pattern between both species are very marked.

At this point it seems necessary to discuss the diagnostic value of colour characteristics in the genus *Lycodon*. It is known that some members of this genus show a very distinct light banding as juveniles, which slowly fades away during growth (for example *L. effraensis* from Thailand, Malaysia, and Indonesia, and *L. subcinctus*, with a wide distribution in South- and Southeast-Asia; Manthey & Grossmann 1997). The bands disappear first on the tail and posterior part of the body, until none or just some faint bands on the anterior part of the body remain in the adults. But even if an ontogenetic loss or a partly loss of the light banding in the new species is taken into consideration (so far nothing is published about ontogenetic colour

changes for any of the endemic *Lycodon* species of the Philippines), differences between *L. fausti* and *L. muelleri* would become even more distinct, as the latter is characterized by an extremely high (51-70) number of light body bands, which do not disappear during growth.

Acknowledgments

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